

CLAIMS

What is claimed is:

1. A fluid retaining apparatus, in a top drive assembly for retaining fluid in the top drive
5 assembly when a tubular is disconnected therefrom, comprising:
 - a first tubular body adapted to be detachably mounted below said top drive;
 - a second tubular body adapted to be inserted into said first tubular body;
 - said second body being a downwardly extending closure member, said closure member
having a bore extending axially therethrough;
 - 10 an axially movable piston disposed within said second body, said piston having a flange
extending radially outwardly therefrom into contact with said body, a passage having a cross-
sectional area for the flow of fluid therethrough, said passage being substantially coaxial with
said bore, and a top side;
 - said closure member having an upper side, wherein said upper side further comprises a
15 plurality of flow passages, each having a cross-sectional area, such that the sum of the cross-
sectional areas of said plurality of flow passages at least substantially equals the cross-sectional
area of said passage within said piston;
 - said upper side further having a plurality of check valves to allow fluid to flow upwardly
therethrough, wherein said flow allows downhole pressure to be detected;
 - 20 a ring member engaging the lower end of said body and extending radially inwardly into
contact with a compression spring; and
 - said compression spring disposed within said body and compressed between said flange
and said ring member, wherein said compression spring urging said piston axially upward

blocking said plurality of flow passages, thereby preventing the downward flow of fluid therethrough.

2. The fluid retaining apparatus of Claim 1, wherein said top side of said piston includes at least one replaceable wear member at the position where said piston contacts said closure member when said plurality of flow passages are blocked by said top side of said piston.

3. The fluid retaining apparatus of Claim 1, wherein said ring member is adapted for movement between a plurality of axial positions within said body to vary the compression of said compression spring to compensate for varying fluid weights.

4. A fluid retaining apparatus, in a top drive assembly for retaining fluid in the top drive assembly when a tubular is disconnected therefrom, comprising:

a remote controlled shut-off valve mounted within a first tubular body, wherein said first tubular body is adapted to be detachably mounted below said top drive, wherein said remote controlled shut-off valve controls fluid flow into and out of said top drive;

said first tubular body having a top end and a bottom end;

a second tubular body adapted to be insertably mounted in said bottom end of said first tubular body;

said second body being a downwardly extending closure member, said closure member having a bore extending axially therethrough;

an axially movable piston disposed within said second body, said piston having a flange extending radially outwardly therefrom into contact with said body, a passage having a cross-

sectional area for the flow of fluid therethrough, said passage being substantially coaxial with said bore, and a top side;

said closure member having an upper side, wherein said upper side further comprises a plurality of flow passages, each having a cross-sectional area, such that the sum of the cross-sectional areas of said plurality of flow passages at least substantially equals the cross-sectional area of said passage within said piston;

said upper side further having a plurality of check valves to allow fluid to flow upwardly therethrough, wherein said flow allows downhole pressure to be detected;

a ring member engaging the lower end of said body and extending radially inwardly into contact with a compression spring; and

said compression spring disposed within said body and compressed between said flange and said ring member, wherein said compression spring urging said piston axially upward blocking said plurality of flow passages, thereby preventing the downward flow of fluid therethrough.

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5. The fluid retaining apparatus of Claim 4, further comprising:

a third tubular body detachably mounted below said fluid retaining apparatus; and
a manually controlled shut-off valve mounted within said third tubular body, wherein said manually controlled shut-off valve further controls fluid flow into and out of said top drive.

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6. A valve for retaining fluid in a kelly when a tubular is disconnected therefrom, comprising:

said kelly having an upper end and a lower end;

a first tubular body adapted to be detachably mounted to the lower end of said kelly;
a second tubular body adapted to be inserted into said first tubular body;
said second body being a downwardly extending closure member, said closure member having a bore extending axially therethrough;

5 an axially movable piston disposed within said second body, said piston having a flange extending radially outwardly therefrom into contact with said body, a passage having a cross-sectional area for the flow of fluid therethrough, said passage being substantially coaxial with said bore, and a top side;

 said closure member having an upper side, wherein said upper side further comprises a
10 plurality of flow passages, each having a cross-sectional area, such that the sum of the cross-sectional areas of said plurality of flow passages at least substantially equals the cross-sectional area of said passage within said piston;

 said upper side further having a plurality of check valves to allow fluid to flow upwardly therethrough, wherein said flow allows downhole pressure to be detected;

15 a ring member engaging the lower end of said body and extending radially inwardly into contact with a compression spring; and

 said compression spring disposed within said body and compressed between said flange and said ring member, wherein said compression spring urging said piston axially upward blocking said plurality of flow passages, thereby preventing the downward flow of fluid
20 therethrough.

7. A valve for retaining fluid in a rig assembly when a tubular is disconnected therefrom, comprising:

a tubular body being a downwardly extending closure member, said closure member having a bore extending axially therethrough;

an axially movable piston disposed within said second body, said piston having a flange extending radially outwardly therefrom into contact with said body, a passage having a cross-sectional area for the flow of fluid therethrough, said passage being substantially coaxial with said bore, and a top side;

said closure member having an upper side, wherein said upper side further comprises a plurality of flow passages, each having a cross-sectional area, such that the sum of the cross-sectional areas of said plurality of flow passages at least substantially equals the cross-sectional area of said passage within said piston;

said upper side further having a plurality of check valves to allow fluid to flow upwardly therethrough, wherein said flow allows downhole pressure to be detected;

a ring member engaging the lower end of said body and extending radially inwardly into contact with a compression spring; and

said compression spring disposed within said body and compressed between said flange and said ring member, wherein said compression spring urging said piston axially upward blocking said plurality of flow passages, thereby preventing the downward flow of fluid therethrough.

8. The valve of Claim 7, further comprising:

a threaded rod having a first end and a second end, wherein said threaded rod is used for the installation and removal of said valve;

said first end being threaded and said second end being adapted to hold said threaded rod;

an internally threaded member threadedly engaged with said threaded rod; and

an internally threaded circular plate, wherein said circular plate is threadedly engaged with said threaded rod and positioned between said first end and said internally threaded member,

and wherein rotation of said internally threaded member causing the removal of said

5 valve.

9. The valve of Claim 7, wherein said retaining ring further comprises a threaded connection adapted to receive a removal tool adapter.

10 10. The removal tool adapter of Claim 9, further comprising a circular plate defining an aperture therethrough, wherein the outside diameter of said circular plate is threaded and wherein said aperture is threaded.

11. A valve for retaining fluid in a rig assembly when a tubular is disconnected therefrom,
15 comprising:

a cylinder having a first end and a second end, wherein said cylinder houses said valve;

a piston having a fluid passageway along its entire length, and having first and second ends, said first end of said piston having a first external diameter, and said second end of said piston having a second external diameter greater than said first external diameter, and a spring
20 having first and second ends and sized to slide over the first end of said piston, but not over the second end of said piston; and

an adjustment ring having external threads selected to be threaded into the second end of said cylinder and to bear against the first end of said spring, wherein said adjustment ring is

threaded into the second end of said cylinder against one end of said spring.

12. The valve of Claim 11, wherein said retaining ring further comprises a threaded connection adapted to receive a removal tool adapter.

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13. The valve of Claim 11, further comprising a plurality of check valves, wherein said check valves allow wellbore fluid to communicate with said rig assembly.

14. The valve of Claim 11, wherein said spring urges said piston upwardly when a fluid pump
10 is de-energized, and wherein said fluid pump is in fluid communication with said valve.

15. The valve of Claim 14, wherein said spring is compressed downward when said fluid pump is energized, and wherein said piston is urged downward.

15 16. A method for retaining fluid, in a top drive unit, of a top drive assembly, when a tubular is disconnected therefrom, comprising:

detachably mounting a first tubular body below said top drive;

inserting a second tubular body into said first tubular body, wherein said second tubular body is a valve;

20 disposing an axially movable piston within said second tubular body, said piston having a flange extending radially outwardly therefrom into contact with said body, a passage having a cross-sectional area for the flow of fluid therethrough, and a top side;

providing said valve with a plurality of flow passages each having a cross-sectional area

such that the sum of the cross-sectional areas of said plurality of flow passages at least substantially equals the cross-sectional area of said passage within said piston;

providing said valve with a plurality of check valves to allow fluid to flow upwardly therethrough, wherein said flow allows downhole pressure to be detected;

5 engaging a ring member in the lower end of said body, wherein said ring member extends radially inwardly into contact with said piston; and

compressing a compression spring disposed within said body between said flange and said ring member;

urging said piston axially upward, by said compression spring, so that said plurality of
10 flow passages is blocked by said top side of said piston, thereby preventing the downward flow of fluid therethrough.

17. The method of Claim 16, further comprising the steps of:

de-energizing a fluid pump, wherein pump urges fluid through said top drive unit; and

15 disconnecting said tubular from said top drive assembly.

18. The method of Claim 17, wherein compression of spring is partly dependent on the relative axial position of said ring member when engaged in said lower end of said body.